

NANO - Memory Game
Nanotechnology applications



Fabric

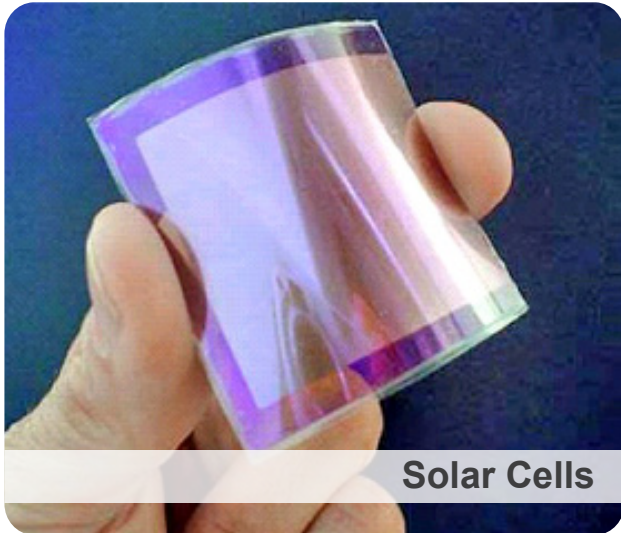


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Nanotechnology can be used to create fabrics with superior performance without compromising the look, feel or comfort of the fabric. For instance, nanomaterials can be added to the fabric and make them stain resistant.



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Solar Cells



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Using nanoparticles in the manufacture of solar cells is beneficial because:-
They can reduce manufacturing costs by using a low temperature process instead of the high temperature vacuum deposition process typically used to produce conventional cells made with crystalline semiconductor material.
They can reduce installation costs by producing flexible rolls instead of rigid crystalline panels.
Currently available nanotechnology solar cells are not as efficient as traditional ones, however their lower cost offsets this. In the long term nanotechnology versions should both be lower cost and, using quantum dots, should be able to reach higher efficiency levels than conventional ones.



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Sunscreen



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Titanium dioxide confers the white appearance of high-protection sunscreens. Titanium oxide nanoparticles have a comparable UV protection property to the bulk material, but lose the cosmetically undesirable whitening since the particle size is decreased.



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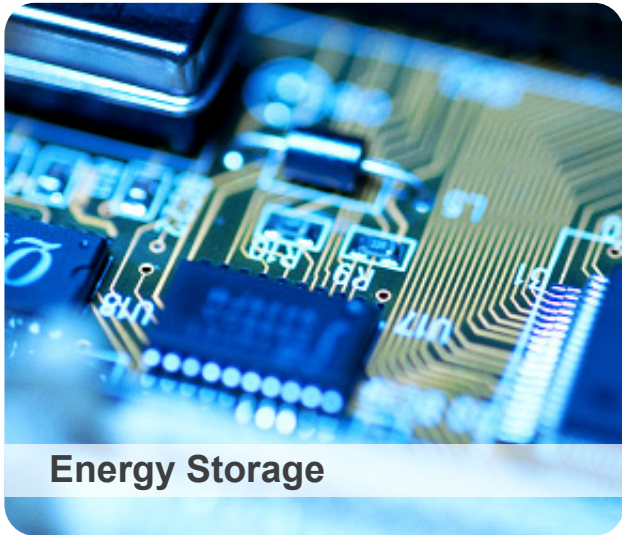
Self-cleaning glass works two ways.

1. A process called photo-catalysis is the action of light onto the surface of the glass to basically “eat” the dirt on the surface.
2. A process known as hydrophilicity. This means that the glass “loves water” and any rain water impacting on the surface will form sheets that will wash down any dirt in a uniform fashion.

These two processes are introduced using a coating of titanium dioxide on the outside surface of the glass. Titanium dioxide is an inorganic pigment which is widely used in a whole variety of products and in this case is a very thin coating on the outside surface of the glass. It has a thickness of about 25nm.



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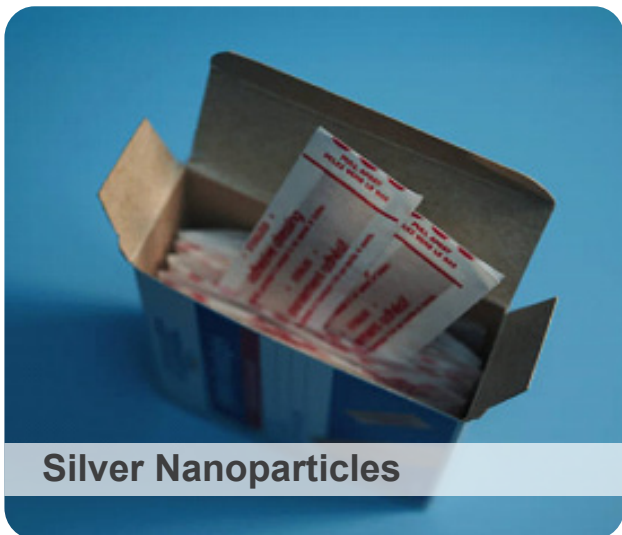


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Nanostructured devices have the potential to serve as the basis for next-generation energy systems that make use of densely packed interfaces and thin films. Researchers have developed metal-insulator-metal nano-capacitors. It is possible to accommodate one million such tiny capacitors on one square centimetre area. The use of such capacitors in battery and other energy storage devices may increase the efficiency and capacity of such devices enormously.



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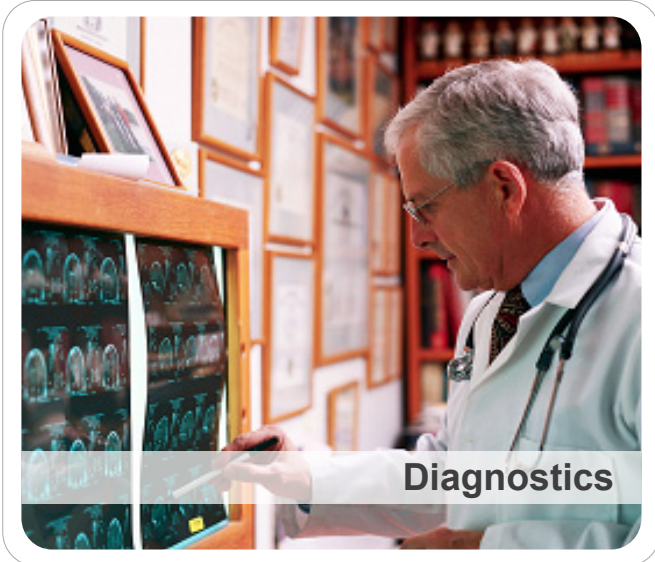


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For centuries, silver has been used for its ability to destroy bacteria — from ancient Romans treating their water with silver coins to NASA using the metal to purify water aboard the Space Shuttle. Silver(Ag) nanoparticles are embedded in sticking plasters for their ability to inhibit the transmission of viruses.



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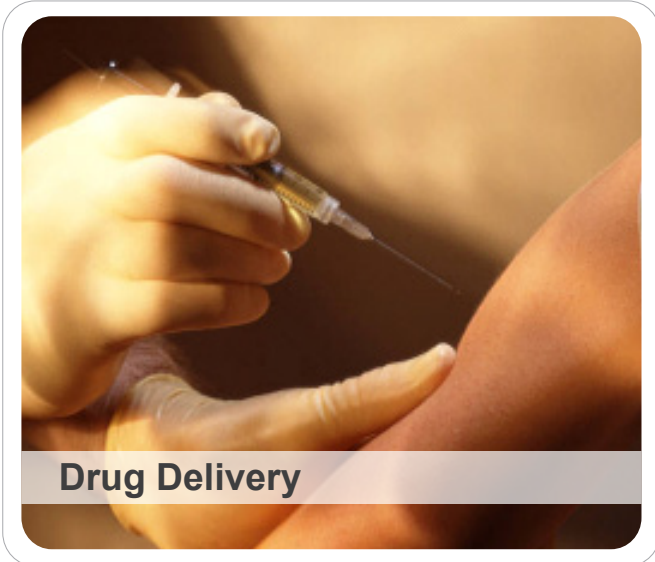
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Pancreatic cancer has a devastatingly low survival rate (less than 5 percent after 5 years) because it is usually diagnosed at an advanced stage.

Scientists have created tools for the early diagnosis of pancreatic cancer by attaching a molecule that binds specifically to pancreatic cancer cells to iron oxide nanoparticles that are clearly visible under magnetic resonance imaging (MRI).



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If you hate injections, you'll be glad to hear that oral administration of drugs that are currently delivered by injection may be possible in many cases. The drug is encapsulated in a nanoparticle which helps it pass through the stomach to deliver the drug into the bloodstream. There are efforts underway to develop oral administration of several different drugs using a variety of nanoparticles. One company has progressed to the clinical testing stage with a drug for treating systemic fungal diseases.

